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Maritimes Region

Canadian Science Advisory Secretariat
Science Response 2015/017

LOBSTER (*HOMARUS AMERICANUS*) OFF THE ATLANTIC COAST OF NOVA SCOTIA (LOBSTER FISHING AREAS 27-33): 2015 STOCK STATUS UPDATE

Context

The scientific basis for assessing Lobster Fishing Areas (LFAs) 27-33 was last examined at a framework meeting in February 2011, followed by an assessment in July 2011. (DFO 2011, Tremblay et al. 2011, Tremblay et al. 2012b). These processes identified three stock units: LFA 27, LFAs 28-32 and LFA 33 and tabled key indicators. Upper stock reference points based on landings are provided in the Inshore Lobster Integrated Fisheries Management Plan. These were modified in 2012 (DFO 2012, Tremblay et al. 2012a) and no other reference points are available currently. Other stock references will be explored in the next framework. As established in 2014 for LFA 34 and LFAs 35-38, this Science Response updates key abundance indicators: landings, catch rate of commercial sizes, and catch rate of sublegal sizes to the end of the 2014 fishing season (2013-14 for LFA 33).

This Science Response Report results from the Science Response Process of February 17, 2015, on the Lobster Fishing Areas (LFA) 27-33 Lobster Stock Status Update.

Background

Description of the Fishery

LFAs 27-33 are on the Atlantic coast of Nova Scotia from northern Cape Breton to Shelburne County on the south shore (Figure 1). Recent commercial landings for stock assessment units 27, 28-32 and 33 (Figure 2) are all high relative to the long-term means. For LFA 33 in particular, recent landings are the highest since the early 1900s and possibly since the beginning of the fishery in the 1800s (Tremblay et al. 2011).

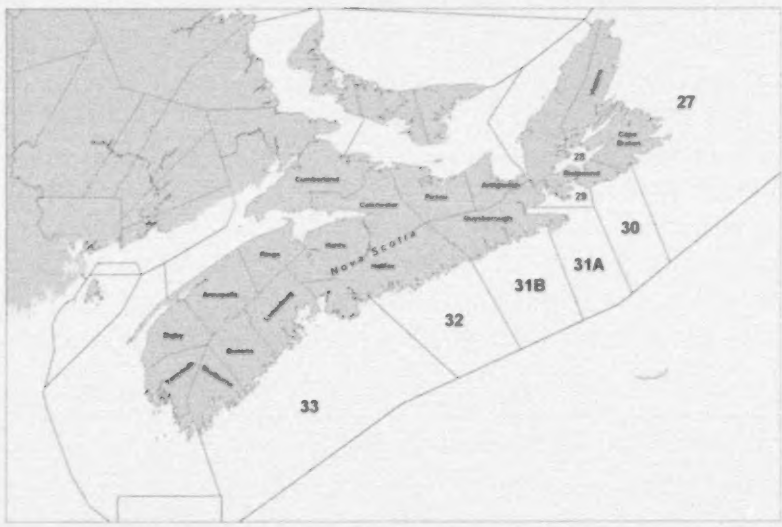

Figure 1. Lobster Fishing Areas (LFAs) 27-33.

Canada

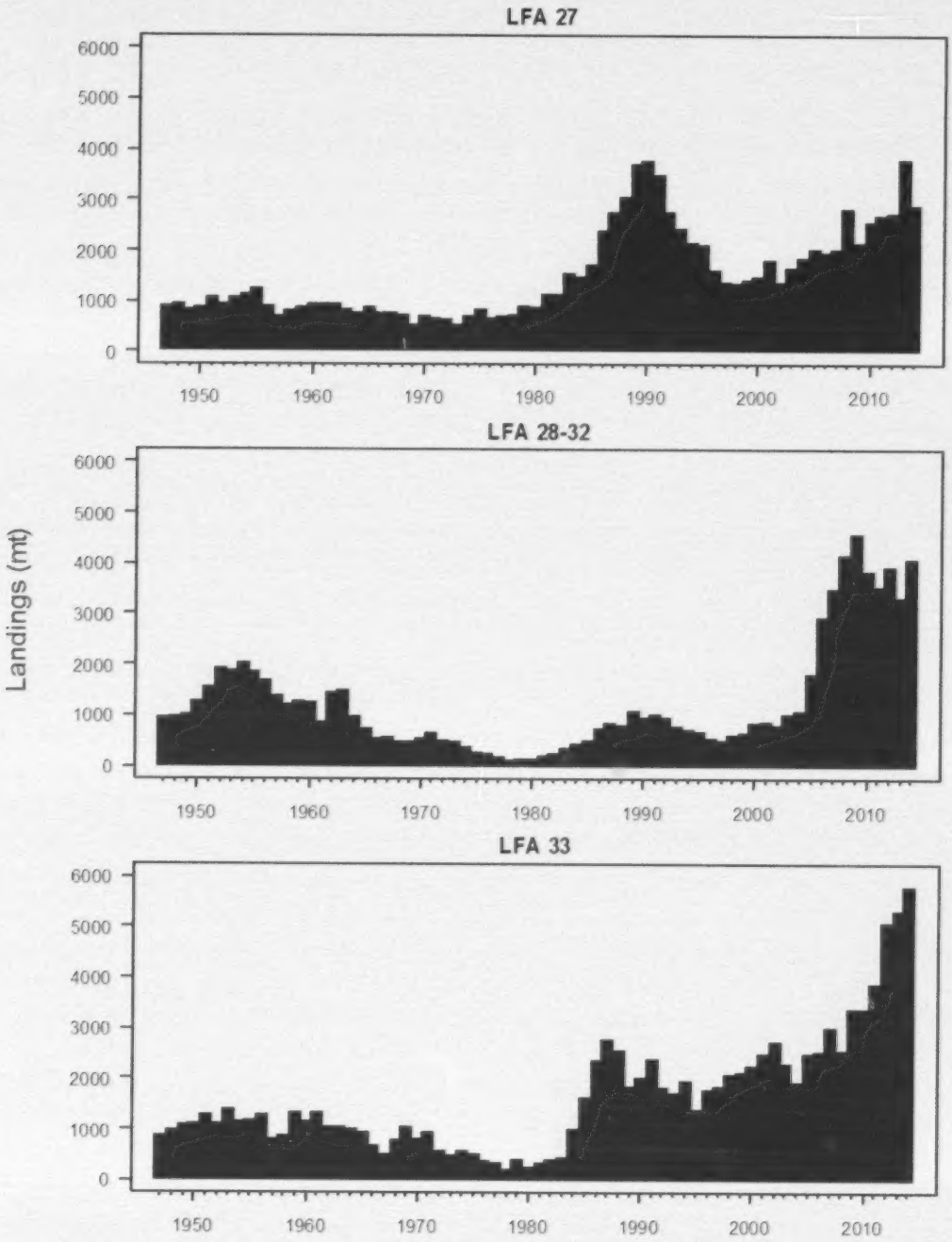

Figure 2. Annual lobster landings in metric tonnes (mt) by the commercial fishery in LFAs 27, 28-32 and 33 from 1947 to 2014 (2013-14 for LFA 33). 2014 landings are preliminary.

Management measures (Table 1) include closed seasons, limits on the number of licenses, trap limits, minimum legal sizes (MLS) and protection of females with eggs (ovigerous or "berried"). There is a possession restriction of V-notched lobsters except in LFA 27 and LFA 31A.

Table 1. Numbers (No.) of licenses and management measures in LFAs 27-33 as of February 10, 2015.

LFA	Season	Total No. of Licenses	Trap Limit[1]	MLS (mm)	Other Measures
27	May 15 - July 15	524[2]	275	82.5	
28	April 30 - June 30[3]	14	250	84	Max. hoop size – 153 mm
29	April 30 - June 30[3]	64	250	84	Max. hoop size – 153 mm
30	May 19 - July 20	20	250	82.5	Max. carapace length -135mm for females
31A	April 29 - June 30	72	250	82.5	Closed window,114-124 mm
31B	April 19 - June 20	71	250	82.5	V-notching and release of 110 lb of mature females/licence
32	April 19 - June 20	159	250	82.5	V-notching, and release of 110 lb of mature females/licence
33	Last Mon. Nov - May 31	700	250	82.5	

[1] Trap limit is for category "A" licence holder. Part-time or category "B" licences are allowed 30% and Partnerships 150% the limit of a single full-time licence.
[2] 482 within Maritimes Region
[3] The season in the Atlantic Fishery Regulations for LFAs 28 and 29 is May 9th to July 9th and May 10th to July 10th, respectively. The season for both areas is regularly varied to April 30th to June 30th.

There have been some significant changes in management measures in LFAs 27-33 since 1998. The largest change was an increase in the MLS in LFA 27 from 70 to 76 mm carapace length (carapace length [CL]; 1998-2002), from 76 to 81 mm CL (2007-2009) and from 81 mm to 82.5 mm CL in 2014. Other measures were adopted in other LFAs. Voluntary V-notching can occur in all LFAs, but in LFA 27 and 31A, V-notched lobsters can be legally retained.

Analysis and Response

Landings-based reference points are part of the current Inshore Lobster Integrated Fishery Management Plan (IFMP) for LFAs 27-38. These were modified using an alternative reference time period (1985-2009 instead of 1985-2004) at a Maritimes Region Science Advisory Meeting in 2012 (DFO 2012). It was recognized that using landings as the sole indicator of abundance for lobster stocks has risks. At the framework and assessment for LFAs 27-33 in 2011, the key abundance indicators that were identified were commercial catch rate and catch rate of sublegals in standardized traps maintained by the Fishermen and Scientists Research Society (FSRS). No additional reference points were adopted; this topic will be revisited at the next framework meeting for LFAs 27-33.

Landings

The Upper Stock Reference (USR) for the abundance of legal lobsters based on landings (Table 2) is defined as 80% of the median for the period 1985-2009. The metric for assessing where the stock is relative to the USR is the 3-year running mean of landings. For the season ending in 2013, this metric is well above the USRs for all LFAs individually and as stock assessment units (LFAs 28-32).

Table 2. Lobster Landings 1998-2014 with 3 year mean (2011-2013) and the Upper Reference Point (80% of median 1985-2009) as tabled in DFO 2012.

Year	LFA 27	LFA 28	LFA 29	LFA 30	LFA 31a	LFA 31b	LFA 32	LFA 28-32	Season	LFA 33
1998	1347	12	52	70	72	128	200	643	97-98	2104
1999	1425	5	50	70	78	139	217	658	98-99	2162
2000	1505	5	54	54	87	212	299	860	99-00	2297
2001	1820	5	66	98	100	204	304	906	00-01	2521
2002	1395	8	57	79	103	210	313	815	01-02	2753
2003	1659	13	125	73	152	279	431	1031	02-03	2320
2004	1850	8	190	84	213	305	518	1089	03-04	1955
2005	2036	9	402	112	426	498	924	1850	04-05	2519
2006	1966	11	658	187	672	825	1497	2955	05-06	2556
2007	2024	9	792	216	827	1061	1888	3537	06-07	3033
2008	2849	13	1076	413	962	1031	1993	4199	07-08	2599
2009	2176	14	1088	452	956	1270	2226	4609	08-09	3402
2010	2570	12	914	371	911	1001	1912	3866	09-10	3377
2011	2691	7	727	383	757	925	1682	3557	10-11	3905
2012	2751	11	729	416	807	1080	1887	3965	11-12	5126
2013	3808	12	605	461	671	740	1411	3351	12-13	5342
2014*	2894	10	650	403	789	1139	1928	4085	*13-14*	5829
Mean 2011-13	**3083**	**10**	**687**	**420**	**745**	**915**	**1660**	**3624**		**4791**
Ref Point	**1629**	**120**		**79**	**250**		**242**	**688**		**1838**

NOTE: 2014 figures are as of January 20, 2015 and 2014, values for LFA 27 landings need to be increased by Gulf Region landings in LFA 27.

Commercial Catch Rate

The catch-per-unit-effort (CPUE, in kilogram (kg) / trap haul) of commercial sizes for 2008-14 from commercial logs is shown in Figure 3; partial data from commercial logs for 2004 to 2007 and from some voluntary logs are documented in the last Science Advisory Report (DFO 2011). For LFA 27 north and south, CPUE in 2013 and 2014 was higher than that recorded for 2008-2012. CPUE in LFA 27 in the last two years (approximately 0.7 kg / trap haul) is close to the high values recorded in voluntary logs in the late 1980s (DFO 2011). For LFAs 28-32, current CPUE is well above long-term means for most areas. Current CPUEs for LFAs 31a, 31b and 32 are well above values from voluntary logs for the mid 1980s to 2004 (DFO 2011). For LFAs 28, 30, 31b and 32, CPUE in 2014 was at or near the highest value recorded since 2008. For LFAs 29 and 31a (Chedabucto Bay area), CPUE is down from the peak of 2009 but at approximately 1 kg / trap haul, still much higher than pre-2005. CPUE in LFA 33 continues to be higher in the west than in the east and both areas have increased continuously since 2008. In both the east and west areas, CPUE in recent years is higher than the values recorded in voluntary log records going back to the mid-1980s (DFO 2011).

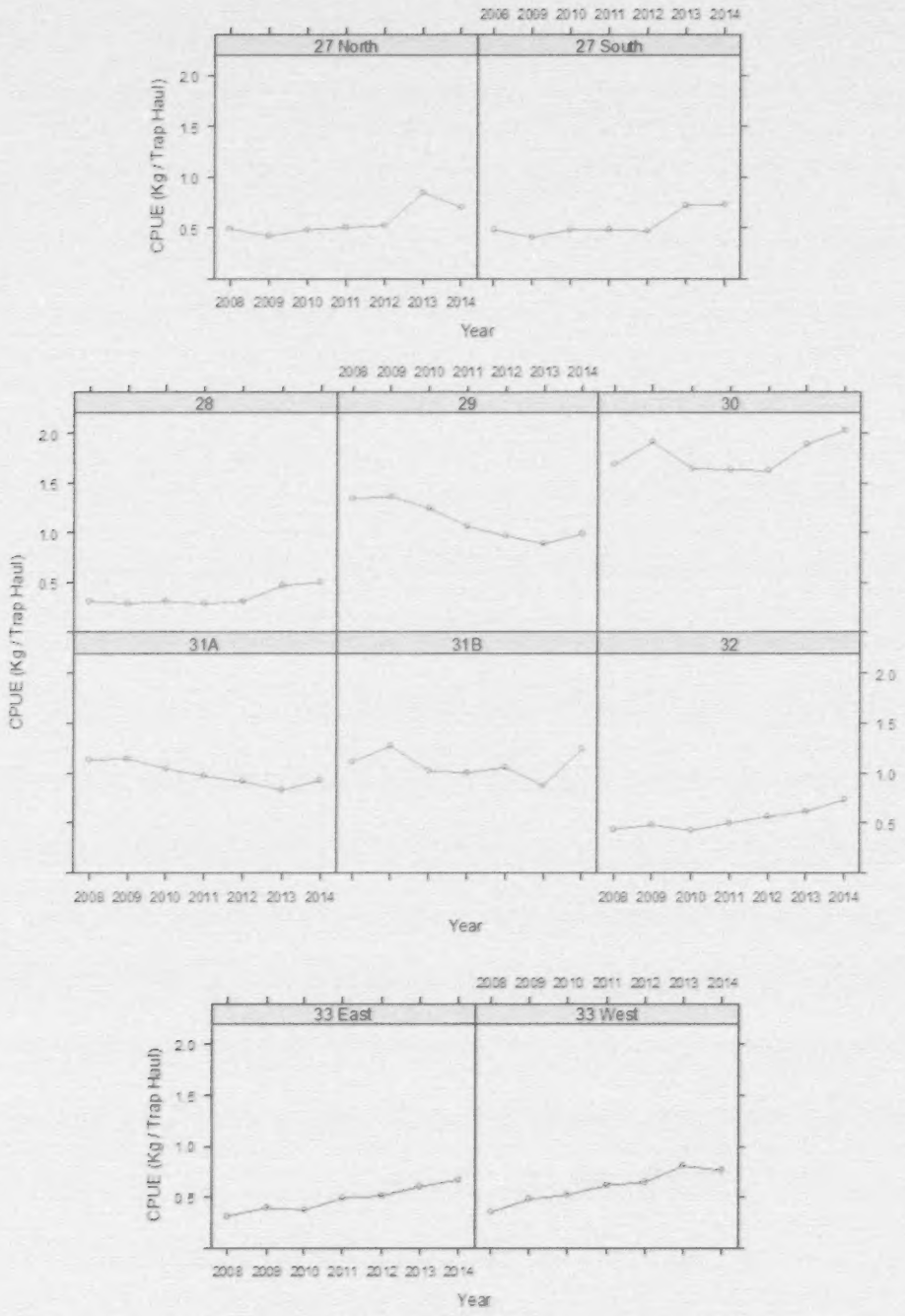

Figure 3. Trend in CPUE (kg / trap haul) for the available time period for LFAs 27, 28-32 and 33. CPUE calculated as total weight landed / total trap hauls for logs which provide complete landings and effort data.

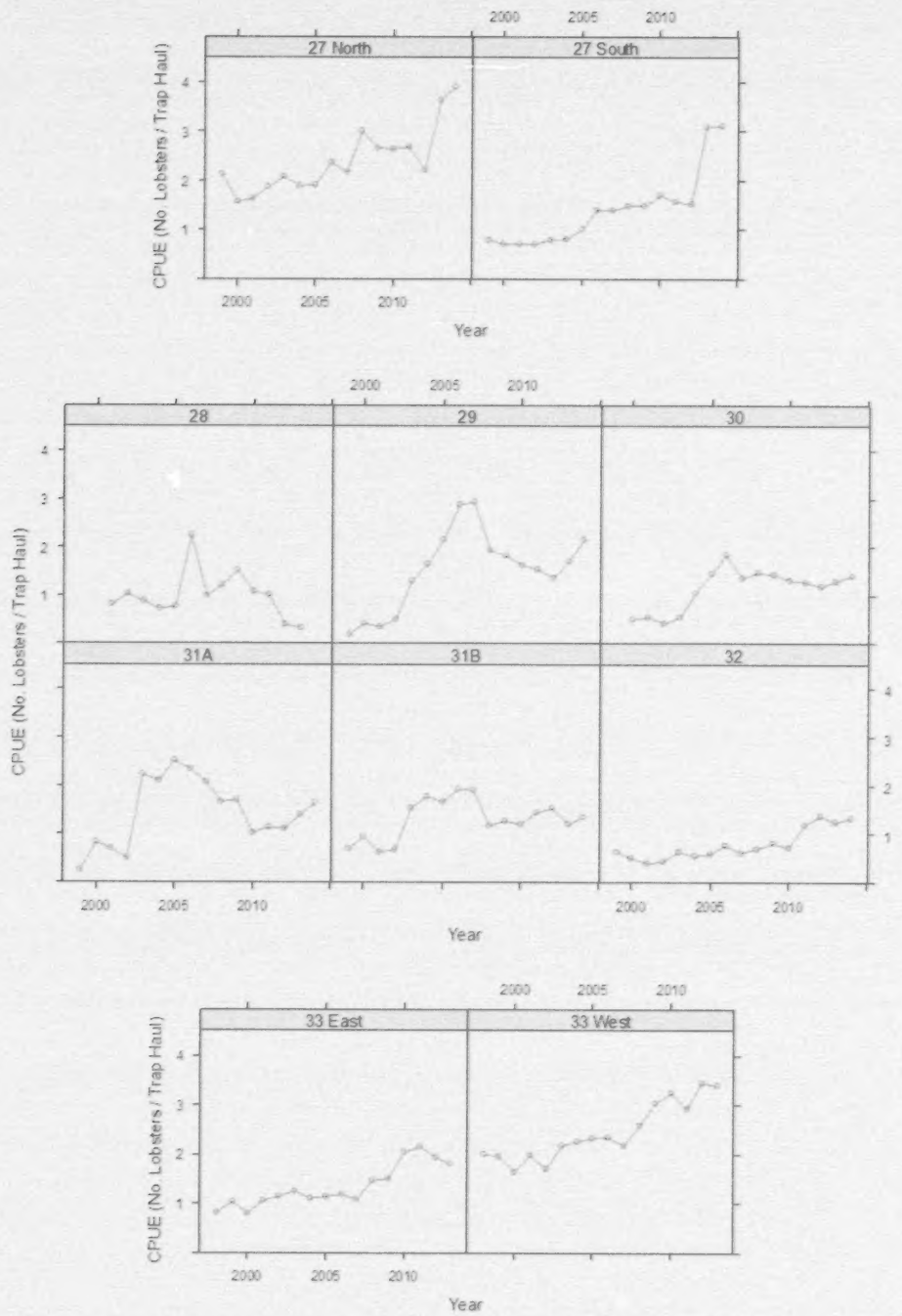

Figure 4. Trend in the catch rate of sublegal Lobsters (total number / total trap hauls) for the available time period for LFAs 27, 29-32 and 33. Trends are from Generalized Linear Models of CPUE.

Catch Rate of Sublegals in Standardized Traps

The CPUE (in number / trap haul) for sublegal sizes for 1998-2014 from FSRS standardized traps is shown in Figure 4. For LFA 27 north and south there has been a substantial increase in the CPUE of

sublegals from 1998-2014. Some of this increase is related to increases in minimum legal size; lobsters that were previously legal are now sublegal but are still retained by FSRS traps.

For LFAs 29-32, sublegal catch rates were all higher in the last three years than the first four years of records (1999-2002). LFAs 29, 31a and 31b are lower than the peaks in 2005, 2006 or 2007 indicating some decline in recruitment. LFA 32 sublegal CPUE is at the highest level for the time period. LFA 33 sublegal CPUE has increased almost continuously since early 2000's.

Conclusions

The lobster stocks in LFAs 27, 28-32 and 33 at the end of the 2014 fishing season were considered to be well within the healthy zone. The 3-year running means of landings for individual LFAs and for LFAs combined as stock units (LFAs 28-32) were all above the proposed USRs. Two key indicators of abundance substantiate that these stocks are in the healthy zone. Catch rates of commercial sizes and of sublegal sizes were high relative to the available time series.

Each of the abundance indicators have strengths and weaknesses that were outlined in the previous assessment. Landings and catch rates from different data sources are providing similar signals, lending confidence to the conclusion that abundance remains high relative to the 1985-2009 period.

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Sources of Information

DFO. 2011. Assessment of Lobster off the Atlantic Coast of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2011/064. 25 p.

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